THESIS TITLE GROWTH, YIELD AND NUTRIENT UPTAKE OF CASSAVA AND PEANUT IN CASSAVA/PEANUT INTERCROPPING SYSTEMS UNDER RAINFED CONDITION AT KHON KAEN PROVINCE

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ABSTRACT

Cassava (*Manihot esculenta* Crantz.) has been considered as one of the important cash crops of Thailand and it has been widely grown in most areas of northeastern region. In order to retain high crop yield with time, the land areas being used to grow this crop must be applied with soil fertility program such as the improvement of soil with the use of leguminous crops. The experiment was carried out at Khon Kaen University Farm in 1997-1998. This is to grow the crops together as an intercropping pattern, hence this research work was implemented in order to determine growth, yields and yield components of both cassava and peanut when grow together as intercropping. The work has been designed to determine also with respect to land use efficiency, farmer income and also the uptake of nutrients by the crops in relation to cropping patterns. The design being used for this work was a Randomized Complete Block Design with three replications. The six treatments consisted of (1) sole crop of cassava grown at 100 x 100 cm between rows and within the row, (2) sole crop of peanut at 50 x 20 cm between rows and within the

row. (3) Cassava at the distances of 100 x 100 cm with one row of peanut in between rows of cassava, (4) cassava at the distances of 100 x 100 cm with two rows of peanut in between rows of cassava. (5) Cassava at the distances of 200 x 50 cm with two rows of peanut in between rows of cassava, (6) similar to no. 5 but with three rows of peanut. Cassava genotype being use was Rayong #5 and Khon Kaen #4 for peanut.

The results showed that there were significant differences among the intercropping patterns being used on plant heights, leaf area indices, stem and leaf dry weights and tuber yields/rai. The results also showed that cassava at 100 x 100 cm with two rows of peanut gave the highest tuber yields (11,174 kg/rai). Sole crop of peanut gave the highest seed yield of 242 kg/rai yet among intercropping patterns, two rows of peanut being grown between rows of cassava gave the highest seed yield i.e. 182 kg/rai. Considering net investment, the results showed that growing two rows and one row of peanut between rows of cassava gave the highest profit over cassava sole crop alone with the margins of 1,832 and 376 Baht/rai, respectively. Growing cassava at 200 x 50 cm with two or three rows of peanut gave lower income when compared with growing cassava alone. Growing cassava and peanut intercropping patterns gave significant values of land use efficiency ranging from 39-91 % but that of cassava with two rows of peanut gave the highest.

The results also showed that nutrient uptake of both intercrops in all cropping patterns with respect to nitrogen, phosphorous, and potassium was higher than that of cassava sole crop. Cassava crop plants grown at 100 x 100 cm with one row of peanut taken up much higher nutrients than the rest. Returning of crop residues was highest with those grown at 100 x 100 cm of cassava with two rows of peanut with the amount of all three nutrients (NPK) of 18.9 kg/rai and this pattern of intercropping could be recommended for farmers' uses.